Chapter 4

Waste Management

WASTE MANAGEMENT

SOLID WASTE GENERATION

Indicator 1. Solid Waste Generation and Disposal

Background National data reveal that Americans continue to dispose of a significant amount of garbage. Nationwide, the amount of municipal solid waste disposed at landfills increased from 88.1 million tons in 1960 to 382 million tons in 2000.[1] During 1999 the national per capita municipal solid waste disposal rate was 6.1 pounds per person per day.[2] In Kentucky, per capita garbage disposal is estimated at 5.5 pounds per person per day in 1999.

Municipal solid waste includes durable goods, nondurable goods, containers, food scraps, yard waste and miscellaneous wastes from residential, commercial and industrial sources. Most of the solid waste generated is paper, comprising 38 percent of the waste stream, followed by yard waste (13 percent), food waste (10 percent), plastics (9 percent), metals (8 percent), glass (6 percent), wood (5 percent) and other (10 percent), according to U.S. EPA 1996 estimates.

Goal Reduce the weight of municipal solid waste disposed of at municipal landfills by a minimum of 25 percent by July 1, 1997, using fiscal year 1993 as a base year per KRS 224.43-010.

Progress In fiscal year 1999, 4.87 million tons of waste was disposed of at solid waste municipal landfills in Kentucky. Of this total, 4.059 million tons were classified as municipal household and commercial waste, and 815,947 tons were industrial solid waste. Of the 4.87 million tons of waste disposed of at solid waste landfills, 536,520 tons (11 percent of the total disposed) were imported from out-of-state, most of which was from neighboring states.

Kentucky has seen the amount of municipal waste disposed of at municipal solid waste landfills increase since 1993. This is attributed to an increase in the number of households participating in a garbage collection system as well as the cleanup of hundreds of illegal dumps in the Commonwealth. Therefore, Kentucky has not met its 25 percent waste reduction goal. In fact, the amount of municipal garbage disposed of at landfills during 1999 increased 27 percent over 1993 levels.

At a Glance

Pounds of municipal garbage disposed per person per day
U.S 6.1
Kentucky 5.5

Sources of municipal solid waste
paper. 38%
yard waste 13%
food waste 10%
plastic 9%
metal 8%
glass 6%
wood 5%
other 11%

Tons of garbage disposed of at Kentucky landfills
1993. . 3.83 million tons
1999. . 4.87 million tons

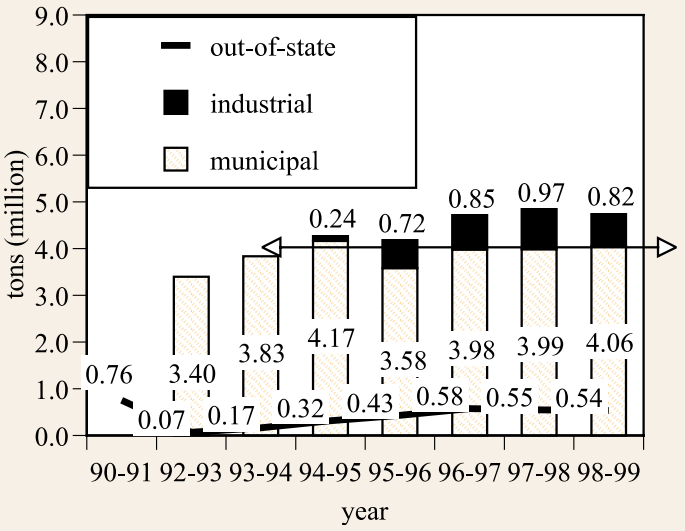
Footnotes

1. "State of Garbage in America," BioCycle, November 2000.
2. Estimate based on 229,556,400 tons of municipal solid waste landfilled in the United States during 1999. Source: BioCycle, November 2000.
3. Based on 4.06 million tons of municipal solid waste disposed at landfills in 1998-99 using the population of 4,041,769.

Measures - notes and sources

Measure 1. *FY - fiscal year. 1990-91 data not available for total waste disposed. Industrial waste data not available for 1992-93 and 1993-94. Out-of-state waste is included in industrial and municipal waste totals. Source: Ky. Division of Waste Management.*

Measure 1. Disposal of Solid Waste at Municipal Solid Waste Landfills in Kentucky



MSW Landfills and Capacity

Indicator 2. Municipal Solid Waste (MSW) Landfills and Capacity

At a Glance

MSW landfills
operating 26
under construction . . 6

MSW landfill capacity
years 17
tons. . . . . 87 million

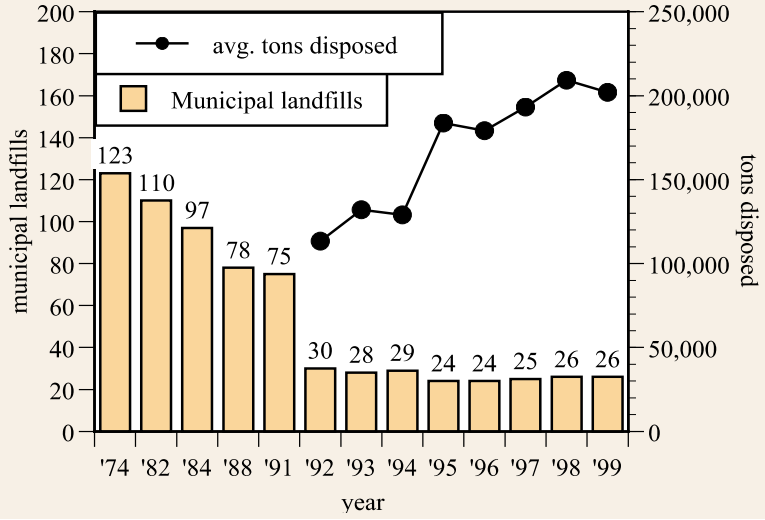
Closed landfills
number 56
with groundwater monitoring 41
with contamination 20

Background Kentucky began regulating solid waste disposal in 1969. At that time there were hundreds of landfills and thousands of open dumps which posed public health and environmental threats. Solid waste issues moved to the forefront of the state's environmental agenda in 1987, after Kentucky was targeted for solid waste disposal by firms in the Northeastern United States, where landfill capacity was virtually nonexistent. This issue, combined with the fact that many landfills were leaking contaminants into ground and surface waters, led to the passage of a state law in 1991 to close substandard landfills, better plan and develop state-of-the-art landfills and ensure the proper disposal of solid waste.

Municipal solid waste (MSW) landfills are operated by private companies, cities, counties or groups of counties. In addition to the 26 active municipal solid waste landfills in Kentucky, construction permits have been approved for six more.

Goal Provide for the management and disposal of waste in a manner that will protect the public health and welfare; prevent the spread of disease and creation of nuisances, conserve our natural resources; enhance the beauty and quality of our environment; and encourage a regional approach to solid waste management.

Measure 1. Municipal Solid Waste Landfills in Kentucky



Progress Solid waste laws and regulations enacted in 1991 and 1992 have led to the closure of 56 of the state's 75 MSW landfills. These closed landfills must monitor groundwater for a two-year period and install a leachate collection system (a system to collect and treat liquids leaching from the landfill) if contamination is detected. Groundwater monitoring systems have been installed at 41 of the closed MSW landfills. Twenty have confirmed groundwater contamination.

Kentucky now has 26 state-of-the-art regional MSW landfills. These landfills must meet stringent construction and operating standards including plastic and clay composite liners (24 landfills) or double composite liners (2 landfills), leachate recovery and the use of a comprehensive system to monitor groundwater for up to 75 different parameters. The 26 MSW landfills are permitted to provide for an estimated 17 years of capacity (approximately 87 million tons or 117 million cubic yards of air space).

The cost to dispose of a ton of waste at landfills (the tipping fee) has increased since the passage of the 1991 solid waste law, when stricter construction and operation standards for MSW landfills took effect. Trends reveal that tipping fees have leveled out during the past four years (1996-1999).

Measure 2. Average MSW Landfill Tipping Fees in Ky.

Year	Tipping Fee (per ton)
1993	$21.69
1994	$23.49
1995	$24.43
1996	$27.49
1997	$27.50
1998	$27.90
1999	$26.44

Measures - notes and sources

Measure 1*. Contained permitted municipal solid waste landfills. Source: Ky. Division of Waste Management.*

Measure 2. *Source: National Solid Waste Management Association, Ky. Division of Waste Management.*

WASTE MANAGEMENT

Indicator 3. Solid Waste Management Facilities

Background In addition to municipal solid waste landfills, Kentucky has other waste management facilities, including 224 construction/demolition debris (CDD) landfills, 23 residual landfills, 68 landfarms and 11 special waste landfills. There are also 177 transfer stations operating in Kentucky which serve as a central location for waste shipping purposes.

Each of these solid waste management facilities receives various types of waste and has different monitoring and closure requirements. CDD landfills are designed to receive construction and demolition debris or other inert waste. Residual landfills are operated by industries to dispose of solid waste by-products from the manufacturing process. Special waste landfills are designed to dispose of high-volume, low-hazard wastes such as mining waste or fly ash generated by power plants. Landfarms are operations that apply solid waste such as biosolids (wastewater treatment sludge) or special waste to the land.

Goal Ensure proper construction, operation and closure of solid waste management facilities to protect public health and welfare, prevent the spread of disease and creation of nuisances, conserve natural resources, and enhance the beauty and quality of the environment.

Progress The number of CDD landfills continues to increase in Kentucky. CDDs less than one acre are exempt from groundwater monitoring and reporting requirements. Of the 224 CDDs, 198 are less than one acre. During fiscal year 1999, 648,667 tons of waste were disposed of at the 26 CDD landfills greater than one acre, three of which had groundwater contamination problems.

In 1999, 814,088 tons of waste were disposed of at the 28 residual landfills operating in the state. All residual landfills are monitoring groundwater and none have confirmed contamination.

Special waste landfills have increased in Kentucky from three in 1993 to 11 in 1999. In 1999, 2.28 million tons of waste were reported disposed of at special waste landfills. Two of the 11 special waste landfills have confirmed groundwater contamination.

Of the 68 landfarm operations permitted to operate in Kentucky, three are required to monitor groundwater and one has detected contamination.

Solid Waste Management Facilities

At a Glance

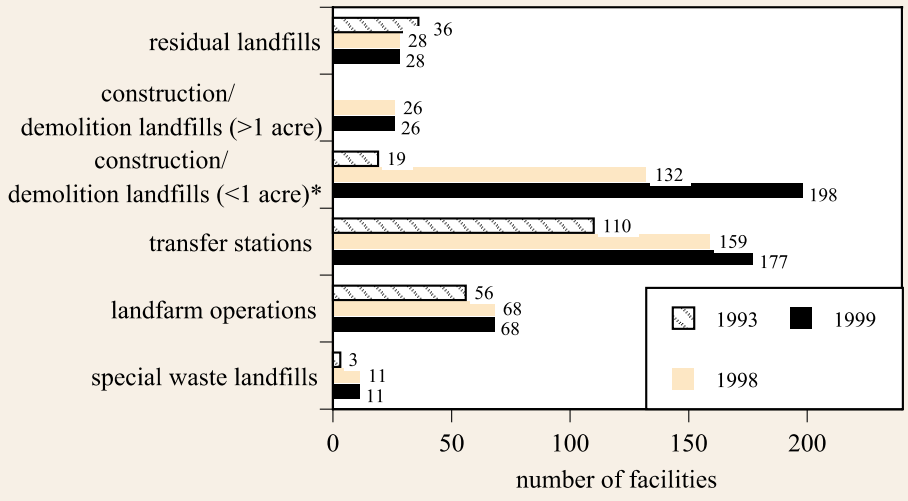
Solid waste management facilities
CDD landfills 224
residual landfills . . 23
landfarms. 68
special waste 11
transfer stations. .177

Solid waste management facilities with groundwater contamination
CDD landfills. 3
special waste 2
landfarms. 1

Measures - notes and sources

Measure 1. **1993 data is for all construction and demolition debris landfills (less than one acre and larger). Source: Ky. Division of Waste Management.*

Measure 1. Solid Waste Management Facilities in Kentucky



Garbage Collection

Indicator 4. Garbage Collection

At a Glance

Percent of Kentuckians participating in garbage collection
door-to-door. 80%
collection stations. . 4%

Estimated amount of garbage disposed of illegally in Kentucky. . . . . 1.5 million lbs. day

Number of counties with mandatory garbage collection ordinances
2000. 28

Average monthly garbage collection fee
1994 . . . . . .$9.64
1999 . . . . . $10.58

Background Garbage collection has long been a challenge in Kentucky. In 1991, only 14 counties offered residents door-to-door garbage collection services. Illegal disposal of garbage prompted the state to adopt a universal collection law in 1990 to help curb open dumping. As a result, 109 counties now have door-to-door as their primary means of garbage collection. However, while the law specifies that counties must provide garbage collection services, it does not mandate participation.

Goal Provide for county universal garbage collection programs by July 1, 1994. The collection programs can be door-to-door, direct-haul to a staffed convenience station, or other alternatives approved by the Natural Resources and Environmental Protection Cabinet.

Progress The primary responsibility for municipal waste collection rests with county governments. Each county has developed ordinances and plans detailing a comprehensive approach to collecting, disposing and reducing solid waste. However, most ordinances are voluntary in nature. To date, only 28 of 120 counties have passed mandatory garbage collection ordinances.

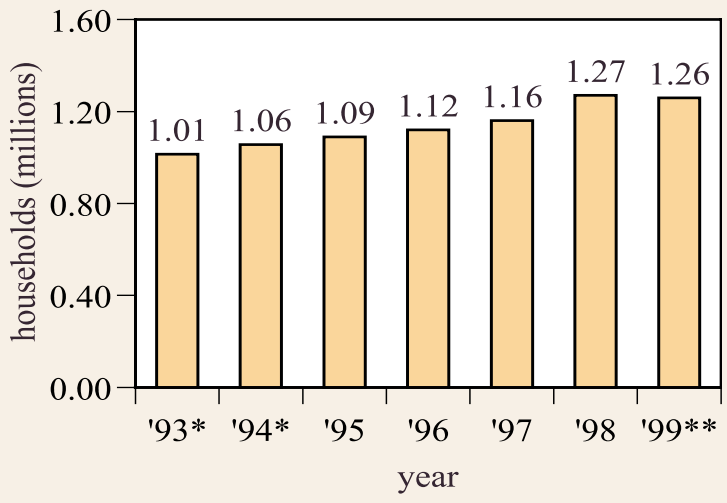
County solid waste reports for 1999 indicate that an estimated 1.26 million households, 80 percent of the state total, participated in a door-to-door garbage collection system. Another 4 percent of the population disposed of its garbage at a collection station, transfer station or convenience center. Data provided by counties reveal an increase of 100,000 households participating in door-to-door garbage collection since 1997.

Garbage collection participation rates vary greatly by county, with 11 counties (Boyle, Grant, Greenup, Hopkins, McCracken, Marshall, Nelson, Owen, Perry, Pike and Todd) reporting 100 percent participation to a low of 22.3 percent participation in Knox County.

During 1994, the average residential garbage collection fee was $9.69 a month. However, when adjusted for inflation (using the Consumer Price Index for 1999), the 1994 fee was $10.89 compared to the 1999 of $10.58 a month, indicating a reduction in garbage collection fee in terms of real dollars.

It is not known how the remaining 16 percent of households disposed of an estimated 3.5

Measure 1. Kentucky Households Participating in Door-to-Door Garbage Collection

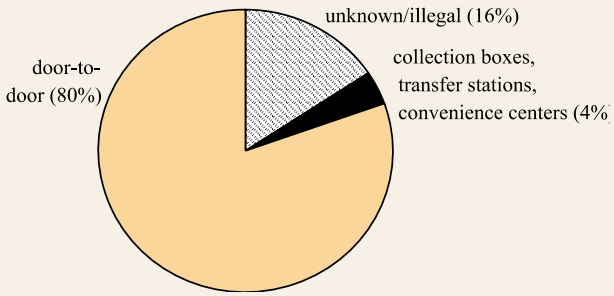


million pounds of garbage a day, since there is no statewide system in place to track disposal methods other than door-to-door collection.[1] Some of this waste may be properly disposed of, however an estimated seven percent (1.5 million pounds per day is illegally dumped).

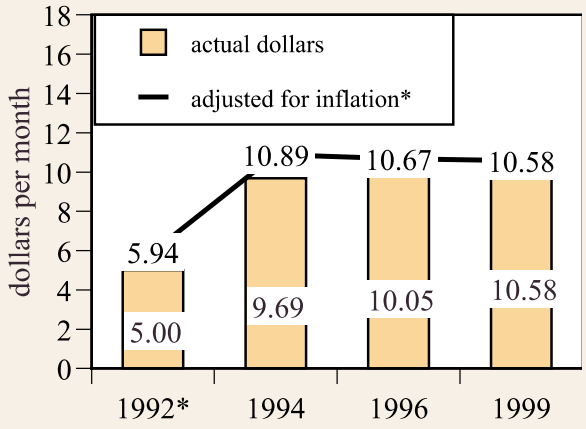
Legislation to require mandatory solid waste collection was considered in the 2001 legislative session. The bill, supported by Gov. Patton, received the support of the House but failed to gain approval in the Senate. Additional legislative measures to require deposits on beverage containers and assess an environmental impact fee on fast food containers also failed to win support.

The Natural Resources and Environmental Protection Cabinet is currently developing a statewide solid waste strategy to focus on garbage collection, recycling and education. In addition, the Certified Clean Community Program created by the governor in 2001 to help fund open dump cleanups for those counties who implement mandatory garbage collection.

Measure 2. Status of Garbage Collection in Kentucky (1999)



Measure 3. Average Monthly Residential Garbage Collection Fees in Kentucky



Footnotes

1. Based on 16 percent of Kentucky's population (646,683) disposing of an average of 5.5 pound of municipal solid waste per day.

Measures - notes and sources

***Measure 1**. *Data represents total collection - door-to-door collection data not available. **Decline in households participating in door-to-door garbage collection between 1998 and 1999 is attributed to reporting discrepancies by counties, according to the Ky. Division of Waste Management. Source: Ky. Division of Waste Management, County Solid Waste Reports.*

***Measure 2**. *Based on an estimated 1,571,588 households. Source: Ky. Division of Waste Management, State Data Center.*

***Measure 3**. *Adjusted for inflation using the average consumer price index for 1999. Source: Ky. Division of Waste Management, County Solid Waste Reports.*

Open Dumps

Indicator 5. Open Dumps

At a Glance

Number of open dumps in Kentucky 3,300

Violations cited for illegal dumping and littering (1999)
state 563
county 4,145

Number of open dumps cleaned
1995 1,761
1997 3,043
1999 2,304

Cost to cleanup open dumps (1999)
. . . . . $6.3 million

Background Each and every day, tons of garbage are illegally dumped in rivers, down hillsides and along roads, polluting the environment and despoiling the beauty of Kentucky's landscape. While the exact amount of garbage illegally disposed of is unknown, thousands of open dumps attest to the fact that illegal dumping remains a considerable problem in the Commonwealth.

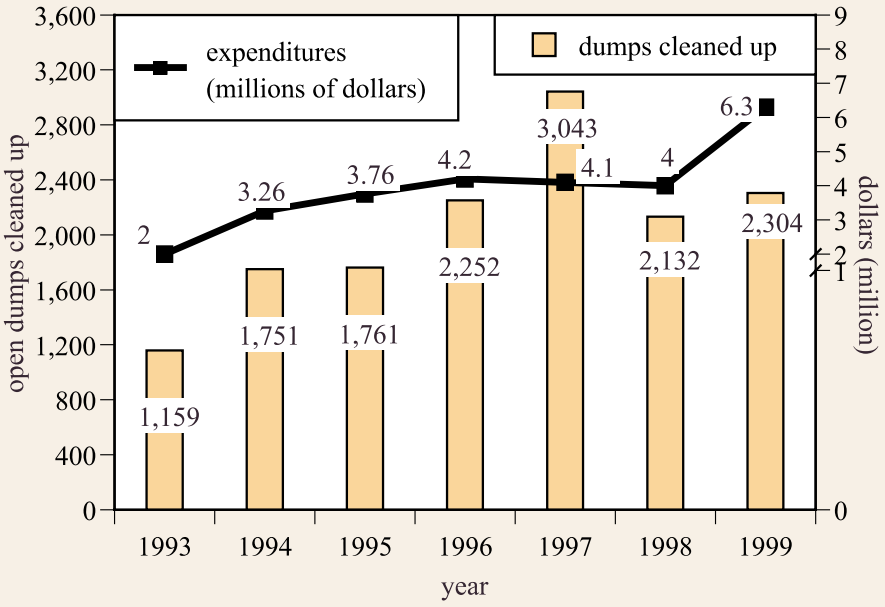
An estimated 84 percent of the state's households participated in some type of garbage collection in 1999. It is not known how the remaining 16 percent disposed of an estimated 3.5 million pounds of garbage a day. Some of this waste may have been hauled to a collection station or landfill, however, an estimated seven percent (1.5 million pounds per day) is illegally dumped.

Goal To encourage state and local governments, business, industry, civic groups, environmental groups and citizens to work together to clean up Kentucky and to educate citizens about the importance of proper garbage disposal.

Progress The state has made impressive gains during the past few years in cleaning up open dumps. In 1996, the Natural Resources and Environmental Protection Cabinet (Cabinet) initiated a campaign to stop illegal dumping. The Cabinet joined other agencies to promote greater public awareness of the threats posed by illegal dumping and to step up enforcement of open-dump laws. A statewide toll-free hotline (1-888-NO-DUMPS) was established in April 1996 to provide Kentuckians an opportunity to report open dumps. More than 3,000 complaints have since been logged on the report-a-dump hotline.

As a result of the state campaign and the efforts of local solid waste management officials and other organizations such as PRIDE (an eastern Kentucky organization established to promote positive environmental action), 2,304 open dumps were reported cleaned up in 1999. That year, county officials issued 4,145 citations for illegal dumping, littering and failure to

Measure 1. Open Dump Cleanups and Expenditures in Kentucky



participate in mandatory garbage collection systems. Of the 4,145 citations, 999 resulted in court actions. Fayette County led the state with 2,172 citations issued in 1999, followed by Jefferson County with 619 citations.

The Cabinet has inspected 3,887 illegal dumps and issued 3,075 notices of violation since 1997, resulting in violators cleaning up 1,063 illegal dumps. Since December 1997, the Cabinet has also placed video surveillance equipment at 92 illegal open dumps and has recorded 109 instances of people illegally disposing of waste. This initiative has resulted in 63 notices of violation, $50,000 in fines, and orders to pick up and dispose almost 200 tons of garbage. However, the Cabinet estimates that at least 3,300 dumps still exist in Kentucky, and more are discovered every day. During the year 2000, the state received 620 illegal dump complaints.

Many counties have hired solid waste coordinators to promote proper solid waste management. Counties with solid waste coordinators have steadily increased—from 40 in 1992, 88 in 1995, to 102 in 1999. Ninety counties have also enacted open dump ordinances to give local officials authority to cite and prosecute violators.

State efforts to address the problem of waste tires continue. Each year, Kentuckians produce 3.8 million waste tires. In 1998, the state spent $2.6 million to clean up seven waste tire piles containing an estimated 2.8 million tires. During 1999, another $1.12 million was spent to clean up 11 tire piles containing 457,092 tires. The General Assembly passed House Bill 636 in 1998 to strengthen the state's waste tire program. A $1 fee for each new tire purchased is used to clean up tire piles and prevent new ones. A major initiative of the program is county-based tire amnesty programs to collect waste tires on a onetime basis free of charge from individuals, farmers and small businesses. By 2002, all counties will hold waste tire amnesty days. In 1998, five counties held amnesty days and collected 43,915 waste tires. In 1999, 22 counties held amnesty days and collected 734,603 tires. In the year 2000, 45 counties hosted amnesty days and collected 2.4 million tires. The tire fee will expire on July 31, 2002.

County and state programs spend an estimated $8 million a year to address roadside litter. A statewide cleanup initiative, entitled Commonwealth Cleanup Week, was established by the legislature in 1998 to promote community involvement in cleaning up roadsides and open dumps. Commonwealth Cleanup Week netted 106,000 bags of trash in 1999 and 2000 and involved more than 36,000 volunteers. Efforts to pass a bottle bill to tackle the litter problem in Kentucky failed to gain support in the 2000 and 2001 legislative sessions.

Measures - notes and sources

Measure 1. *Source: Ky. Division of Waste Management, County Solid Waste Reports.*

Recycling

Indicator 6. Recycling Solid Waste

At a Glance

Recycling rate
U.S. 28%
Kentucky . . . . . unknown

Tons of recyclable materials collected in Kentucky
1994 1,039,534
1999. 1,871,020

Counties with community door-to-door collection of recyclables
1994 4
1999 35

Background Recycling is one of the best environmental success stories of the 20th century. In 1997, the U.S. EPA estimated that 28 percent of the waste generated in the U.S. was recycled, compared to just 16.4 percent in 1990.

However, national recycling rates have fallen for some materials. For example, the nationwide plastic bottle recycling rate fell to 22.1 percent in 1999, compared to 23.5 percent in 1998, according to the American Plastics Council. While more plastic was collected for recycling in 1999 (1.15 billion pounds), it was dwarfed by even larger increases in the amount of plastic bottles sold (6.84 billion pounds). The American Forest and Paper Association reports that 45 percent of paper and paperboard was recovered in 1999—an all-time high spurred by the cellulose insulation industry. The industry's goal is to recover 50 percent of all paper Americans consume. The group also reports the recycled paper accounted for 36 percent of total fiber consumption in 1999.

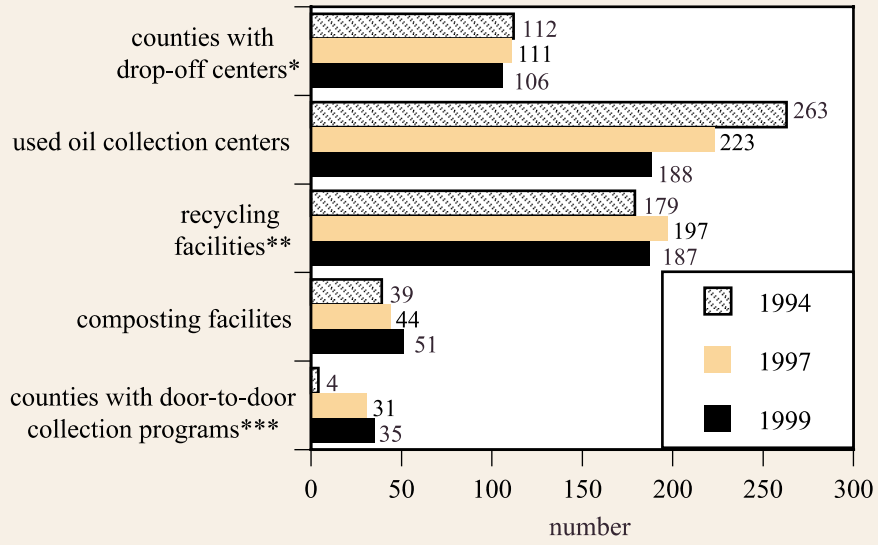
Goal Kentucky does not have a specific recycling goal although it does have a goal to reduce the weight of municipal solid waste disposed of at municipal landfills by a minimum of 25 percent by July 1, 1997, using fiscal year 1993 as a base year per KRS 224.43-010.

Progress

Public awareness of the need to reduce, reuse and recycle wastes continues to grow. More and more households are recycling their waste. Recycling programs vary throughout the Commonwealth. Most Kentucky residents are now within reach of a recycling collection center. In 1999, 106 counties had recycling drop-off centers, 51 had composting facilities, and 35 counties had communities with door-to-door recycling collection programs.

An estimated 1.8 tons of recyclable materials were collected during 1999, according to county solid waste reports. However, it is not possible to determine how much of this waste was actually recycled since recyclers are not required to report this information to the state. In 1999, counties also reported that 3.3 million waste tires were collected for recycling or

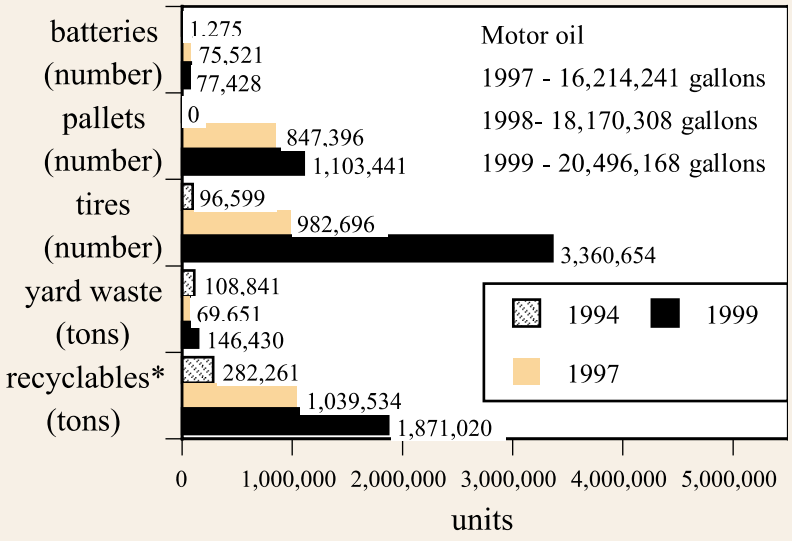
Measure 1. Recycling Facilities and Programs in Kentucky



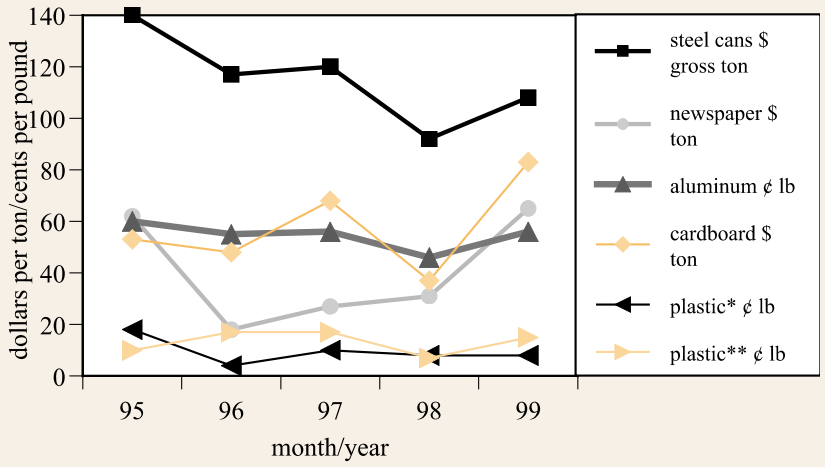
reuse. The increase in the number of tires collected in 1999 is a result of the state's tire amnesty program. That year, the 734,603 tires were collected under the state's tire amnesty program to be beneficially reused (i.e. tire-derived fuel, landfill liners, products) as required by state law.

The recycling market has been unpredictable and cyclical in Kentucky and the nation as indicated in average price trends for various materials. The Kentucky Division of Waste Management formed the Buy Recycled Alliance in 1998 to promote the use of recycled products and strengthen recycling markets in Kentucky. To date, 187 organizations have joined the alliance and have made commitments to buy recycled products.

Measure 2. Collection of Recyclables in Kentucky



Measure 3. Yearly Price Averages of Recyclables in Kentucky



Measures - notes and sources

Measure 1*. *Some counties have more than one drop-off facility. **Total permitted recycling facilities were 124 (those facilities that must separate recyclables from the waste stream). Another 63 facilities operate in Kentucky but are exempt from permitting (those facilities that handle separated materials). ***Counties where one or more communities have door-to-door collection of recyclables.*
Source: Ky. Division of Waste Management.

Measure 2. *Includes data on private and public sector collection where available. *Includes aluminum cans; assorted ferrous and nonferrous metals including white goods; cardboard; newspaper, office and residential paper; glass and plastic. Source: Motor oil data from the Kentucky Used Oil Transporters Annual Report Survey; Ky. Division of Waste Management; County Solid Waste Reports.*

Measure 3. *Yearly averages are for the fiscal year from July 1 through June 30. Not adjusted for inflation. *Polyethylene Terephthlate (PET-soda bottles). **High Density Polyethylene (HDPE-milk jugs). Source: Official Board Markets Yellow Sheet, Recycling Manager, America Metal Market, Ky. Division of Waste Management.*

Solid Waste Enforcement

Indicator 7. Solid Waste Enforcement and Compliance

At a Glance

Number of permitted solid waste facilities
1999 1,026

Inspections
1995 1,233
1999 3,200

Violations
1995 271
1999 723

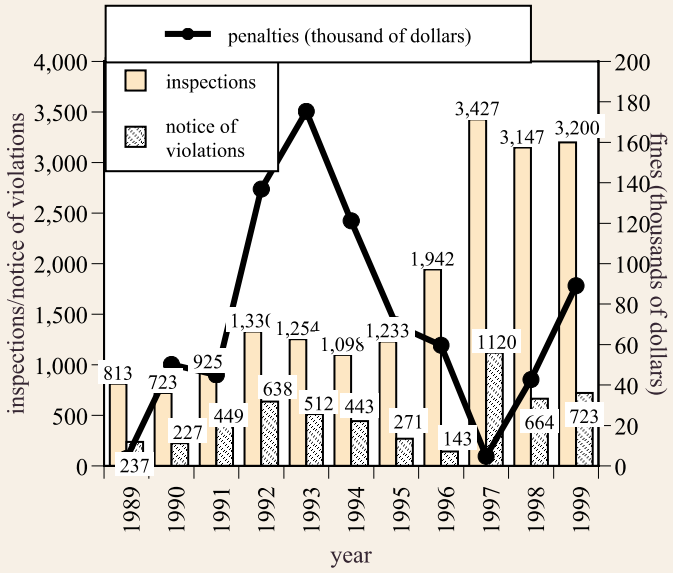
Background Kentucky has passed numerous laws and regulations to ensure the safe disposal of solid waste. But the state still faces numerous solid waste issues—from household garbage collection to ensuring proper operation of landfills and other waste management facilities. Enforcement of solid waste rules provides a good indicator of the state's commitment to carrying out solid waste rules and regulations and ultimately how effective Kentucky is in meeting its waste management goals.

The Kentucky Division of Waste Management regulates 1,026 permitted solid waste facilities. In addition, the state inspectors respond to hundreds of solid waste citizen complaints each year.

Goal Ensure compliance with state and federal solid waste laws and regulations.

Progress Kentucky continues to wage its war against open dumps as part of a 1996 campaign to end illegal disposal of solid waste. In response to that effort, the number of solid waste inspections has increased significantly during the past few years. During 1999, the single largest category of solid waste violations was open dumping, which constituted 78 percent of the 723 violations cited. Solid waste penalties increased during the past two years due to large fines against a few solid waste facilities. For example, during 1998, the Division of Waste Management received payments from a fine totaling $30,000 from a construction and demolition debris landfill case. The division also received large penalty payments ($35,000) related to two landfarm cases.

Measure 1. Solid Waste Enforcement Actions

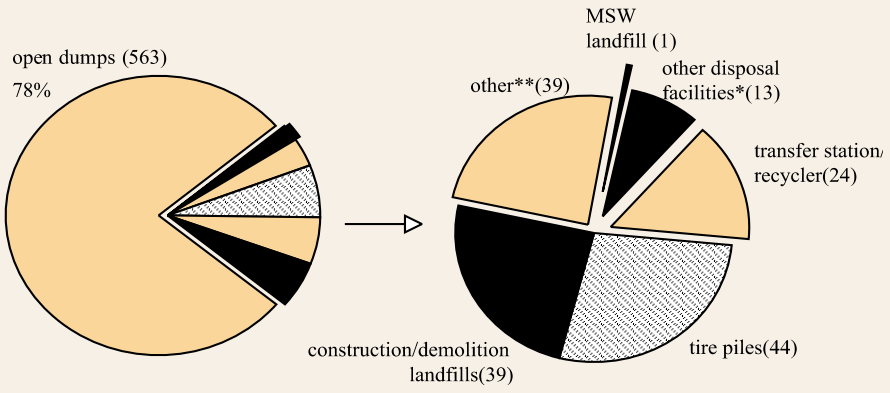


Measures - notes and sources

Measure 1. *Based on penalty collections per year. Source: Ky. Division of Waste Management.*

Measure 2. **Residual landfills, landfarm/compost facilities, convenience centers, other registered sites. **Recyclers, permit-by-rule, road oiling, other. Chart uses revised data from computer system which may differ from previous EQC reports. Source: Ky. Division of Waste Management.*

Measure 2. Solid Waste Violations by Source and Number of Violations



WASTE MANAGEMENT

HAZARDOUS WASTE GENERATION

Indicator 8. Hazardous Waste Generation

Background Hazardous waste has the potential to cause serious health and environmental threats if not managed properly. Hazardous waste is regulated under the federal Resource Conservation and Recovery Act of 1976 (RCRA) and state law. Kentucky assumed authority to carry out the federal hazardous waste permitting and enforcement programs in 1982.

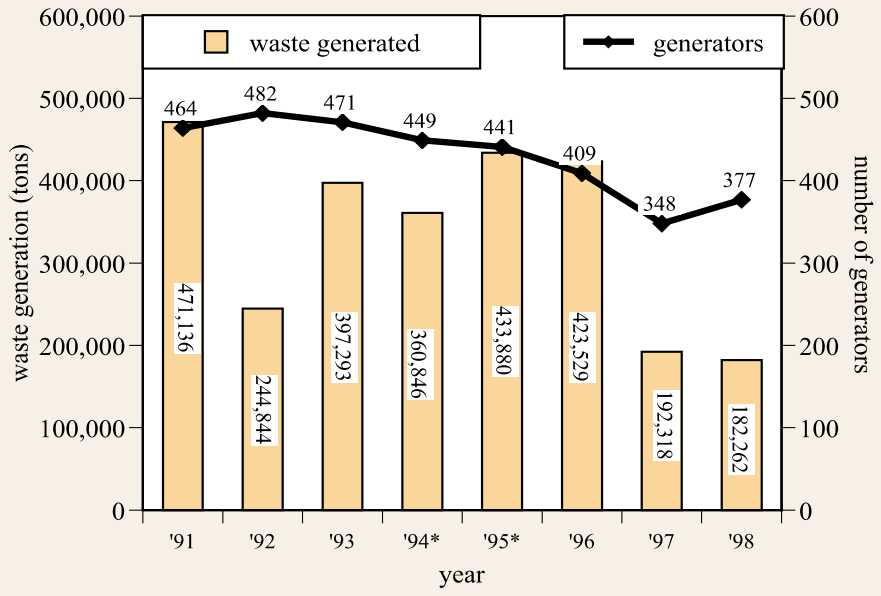
A waste may be classified as hazardous if it exhibits certain characteristics (ignitable, corrosive, reactive or toxic). In addition to these characteristic wastes, a list of over 500 specific hazardous wastes has been developed. Hazardous waste takes many physical forms and may be solid, semisolid, liquid or gas.

The Kentucky hazardous waste program regulates commercial businesses and government facilities that generate, transport, treat, store or dispose of hazardous waste. Each of these entities is regulated to ensure proper management of hazardous waste from the moment it is generated until its ultimate disposal or destruction. Hazardous waste regulations focus on the management of hazardous waste produced by large quantity generators like chemical manufacturers, electroplating companies and petroleum refineries. A large quantity generator is defined as producing 2,200 pounds of hazardous waste in a given month, or 2.2 pounds or more of acutely hazardous waste a month, or 220 pounds of acutely hazardous spill cleanup material in a given month.

Goal Reduce the amount of hazardous waste produced by each generator regulated under KRS 224.46-305 by 25 percent by 1997 and 50 percent by the year 2002, using 1987 as the base year.

Progress In 1998 (the most recent data available from the Division of Waste Management), 377 large quantity generators in Kentucky produced 182,262 tons of hazardous waste that required management in a permitted hazardous waste treatment, storage or disposal facility. These wastes included ignitable wastes such as gasoline, mineral spirits and paint thinners, cleaning solvents and other chemical and toxic wastes. The top 10 generators accounted for

Measure 1. Hazardous Waste Generation in Kentucky



At a Glance

Number of large quantity hazardous waste generators in Kentucky
1995 441
1998 377

Tons of hazardous waste generated in Kentucky
1995. 433,880
1998. 182,262

Top generators of hazardous waste in Kentucky (1998)
Safety Kleen. . . 44,433
Gallatin Steel. . 21,793
Rohm and Haas. 15,494
LWD 12,019

Hazardous Waste Generation

69 percent of the 182,262 tons of waste generated in the state during 1998.

During the past several years (1991-1996) hazardous waste generation in Kentucky has averaged 400,000 tons a year. However, in 1997 and 1998, the generation of hazardous waste dropped by more than half. Though difficult to pinpoint, there are several factors that may account for the decrease in hazardous waste generation, according to the Kentucky Division of Waste Management. First, hazardous waste generation has declined overall nationwide. Next, the U.S. Environmental Protection Agency (EPA) continues to adopt new policies on hazardous waste management and changes to its regulatory requirements. For example, some wastes from remediation projects that once required special treatment or disposal can now be disposed of in solid waste landfills provided that the hazards present are sufficiently below risk assessment thresholds. Finally, some facilities that typically top the list of hazardous waste generators saw marked declines in generation between 1995 and 1998. These include hazardous waste facilities operated by Safety-Kleen and Ken-Dec.

Hazardous wastes are also produced by small businesses such as dry cleaners, auto repair shops, exterminators and photo processing centers. Currently, 534 small quantity generators are registered in Kentucky. A small quantity generator can produce up to 13.2 tons of hazardous waste per year. Generation data for small quantity generators cannot be accessed at this time. However, they likely make up less than 1 percent of the hazardous waste generated in the state.

Hazardous wastes are also generated in the home (mineral spirits, pesticides and house paint). These wastes are exempt from federal or state hazardous waste programs. Some communities in Kentucky, in cooperation with local businesses and industries, have established collection centers or pickup services for the management of household hazardous waste. For example, a regional household hazardous waste collection day held Oct. 2000 in Fayette, Bourbon, Madison and Scott counties netted 11,000 gallons of paint, 11,400 pounds of pesticides, 542 lead acid batteries and 1,060 gallons of oil. Lexington Fayette County Urban County officials estimate 6,125 households participated in the program. Jefferson County established a household hazardous waste collection center in 1996. In the year 2000, 148,095 pounds of household hazardous waste was collected at the center for recycling, reuse and disposal.

Measures - notes and sources

***Measure 1**. 1998 data most recent available. Based on the generation of hazardous waste reported by large quantity generators. Excludes generation of hazardous wastewaters which are no longer reported. Earlier data not available. *1994 and 1995 data differ from previous reports due to RCRIS or industry reporting errors which have been corrected on this chart. Source: RCRIS and BRS database.*

***Measure 2**. *Ashland Petroleum Co. name change to Cattlesburg Refining. Source: RCRIS and BRS Database.*

Measure 2. Top 10 Generators of Hazardous Waste (1998)

Company	City	1995 tons	1998 tons
Safety Kleen	Smithfield	83,575	44,433
Gallatin Steel	Warsaw	7,632	21,793
Rohm & Haas	Louisville	13,195	15,494
LWD, Inc.	Calvert City	11,598	12,019
Cattletsburg Refining*	Catlettsburg	408	10,110
ISP Chemicals	Calvert City	6,585	7,754
Newport Steel	Wilder	4,665	3,685
DuPont Dow	Louisville	3,345	3,651
Ky. Electric Steel	Ashland	3,995	3,499
National Southwire Aluminum	Hawesville	5,901	3,208
total top 10		**140,899**	**125,646**
total state		**433,880**	**182,262**

WASTE MANAGEMENT

HAZARDOUS WASTE IMPORTS AND EXPORTS

Indicator 9. Hazardous Waste Imports and Exports

Background Kentucky, like most states, relies on facilities both inside and outside its borders for recycling, treatment or disposal of hazardous wastes. The amount of waste imported into and exported from Kentucky can vary significantly from year to year.

During 1998, hazardous waste generated in Kentucky was shipped to several states for treatment and disposal. That year, hazardous waste was also imported into Kentucky from 33 states (including Puerto Rico) and from at least one foreign country for treatment and disposal.

Goal Ensure the adequate treatment and disposal of hazardous waste consistent with state and federal rules.

Progress Kentucky remains a net exporter of hazardous waste. The state exported 111,827 tons of hazardous waste out of state for recycling, treatment or disposal in 1998 (the most recent year data is available). This represents 61 percent of the 182,262 tons of hazardous waste reported produced in the state. During 1998, 55,000 tons of hazardous waste was imported into the state for treatment. Both waste exports and imports declined significantly in 1998—41 percent and 42 percent respectively.

Most of the hazardous waste Kentucky receives from out of state is delivered to two large commercial facilities for incineration (LWD Inc.) or fuel blending (Safety-Kleen Envirosystems). Each of these facilities occupies a regional niche in the commercial capacity arena. For the most part, they receive hazardous wastes from states that lack this type of commercial capacity. Shipping costs are often significant and generators search for commercial facilities that are economical to use as well as reliable.

Except for fuel blending and incineration, Kentucky lacks commercial treatment capacity for hazardous waste and there is no commercial disposal capacity within the state. Thus, a significant portion of the state's wastes are shipped to states where regional commercial treatment or disposal facilities exist.

At a Glance

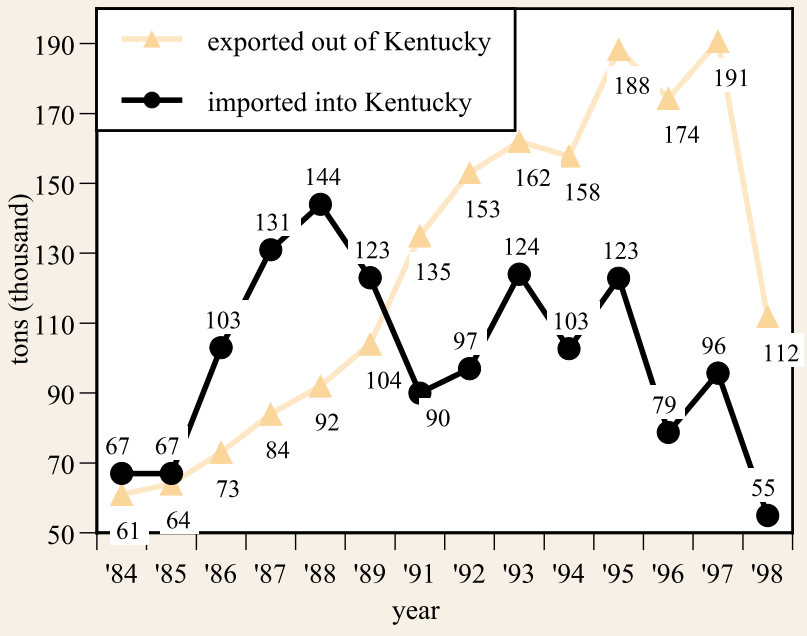
Hazardous waste exported out of Kentucky
1995 . . . . .188,344 tons
1998 . . . . . .111,827 tons

Hazardous waste imported into Kentucky
1995 . . . . .122,863 tons
1998. . . . . 55,000 tons

Measures - notes and sources

Measure 1. *Source: Ky. Division of Waste Management.*

Measure 1. Hazardous Waste Imports and Exports in Kentucky



Hazardous Waste Enforcement

Indicator 10. Hazardous Waste Enforcement and Compliance

At a Glance

Number of hazardous waste facilities (2000)
large generators. . 353
tsd facilities 31
transporters 283
small generators . .502
exempt generators 1,719
recyclers 283
burners/blenders. . 32

Haz. waste inspections
1995 1,783
1999 772

Haz. waste violations
1995 217
1999. 141

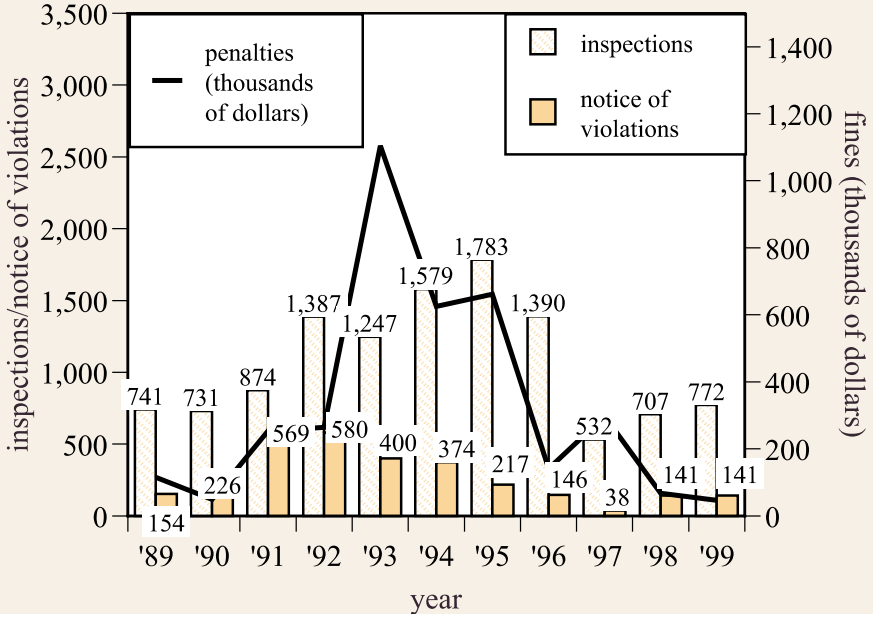
Background Kentucky began regulating hazardous waste in 1979. State hazardous waste permitting and enforcement programs were put in place in 1982. State hazardous waste regulatory programs have evolved since then and now include monitoring, record keeping, emergency planning, closure procedures, identification and the cleanup of waste sites. A number of sources are subject to hazardous waste laws and regulations in Kentucky; they currently include 353 large quantity hazardous waste generators; 31 permitted treatment, storage, and disposal (TSD) facilities; 283 transporters; 502 small quantity generators; 1,719 conditionally exempt small quantity generators; 283 recyclers and 32 burners/blenders. In addition, the state continues to respond to non-notifiers (facilities that fail to report hazardous waste generation) and illegal disposal of hazardous waste.

Goal Ensure that hazardous waste generators and handlers are brought into compliance with state laws and regulations within the shortest possible time after the detection of any violation.

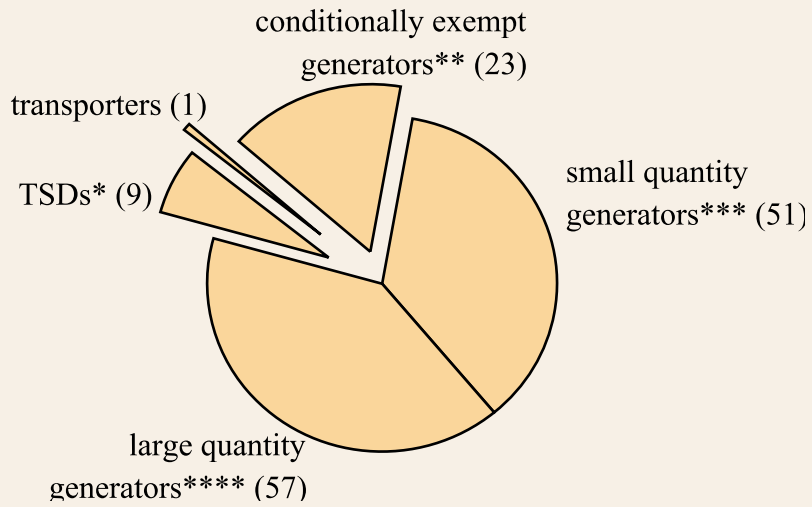
Progress The Kentucky Division of Waste Management is the principal regulatory agency in the state responsible for ensuring that hazardous wastes are properly managed and disposed. In 1995, the number of inspections conducted by the division reached a record high of 1,783 but then fell to a record low of 532 in 1997. The Division of Waste Management attributed the decline in hazardous waste inspections and violations to a shift in enforcement priorities to underground storage tanks and open dumps. However, the state stepped up its hazardous waste enforcement activities in 1999. The number of hazardous waste inspections conducted in 1999 was 772–a 44 percent increase since 1997 when levels were at record lows.

The number of violations cited also increased in 1999 to nearly four times the number cited in 1997. During 1999, the Kentucky Division of Waste Management issued 141 violations and assessed $141,000 in penalties. Forty percent of the violations cited in 1999 were against large quantity generators, followed by small quantity generators (36 percent), and conditionally exempt generators (16 percent).

Measure 1. Hazardous Waste Enforcement Actions



Measure 1. Hazardous Waste Violations by Source and Number in Kentucky (1999)



Measures - notes and sources

***Measure 1**. Chart uses revised and updated data from NREPC computer system which may vary from previous EQC reports. Source: Ky. Division of Waste Management.*

***Measure 2.** *Permitted treatment, storage and disposal facilities that receive waste from off-site. **A generator who accumulates no more than 100 kilograms of hazardous waste in a calendar month or a generator who generates acutely hazardous waste listed in Sections 2, 3, and 4(5) of 401 KAR 31:040 in a calendar month in quantities no greater than 1 kilogram. All quantities of that acutely hazardous waste are subject to administrative regulation under 401 KAR Chapters 32 & 39 and the notification and permitting requirements of KRS 224.01-400, 224.40-310, 224.46-510, 224.46-580, and 224.50-130 to 224.50-413. ***A generator who produces more than 100 kilograms but less than 1000 kilograms of hazardous waste in a calendar month. ****A generator who generates more than 1,000 kilograms per month of hazardous waste or more than 1 kilogram per calendar month of acutely hazardous waste. Source: Ky. Division of Waste Management.*

Contaminated Waste Sites

Indicator 11. Contaminated Waste Sites

At a Glance

Hazardous waste sites
investigated 1,483
contaminated. . . . 1,389
remediated 997

Federal Superfund
sites in Kentucky
number 20
remediated 17

Background In Kentucky, hundreds of old or abandoned waste sites pose threats to the environment and public health. Sites that are highly contaminated, or pose an immediate public health threat, may be proposed for inclusion on the U.S. Environmental Protection Agency (EPA) "National Priority List" (NPL), better known as Superfund. Contaminated sites that do not qualify for federal Superfund status become the state's responsibility. Past hazardous waste management practices have led to numerous contaminated waste sites across the state. Some common sites include abandoned warehouses, manufacturing facilities, processing plants and landfills.

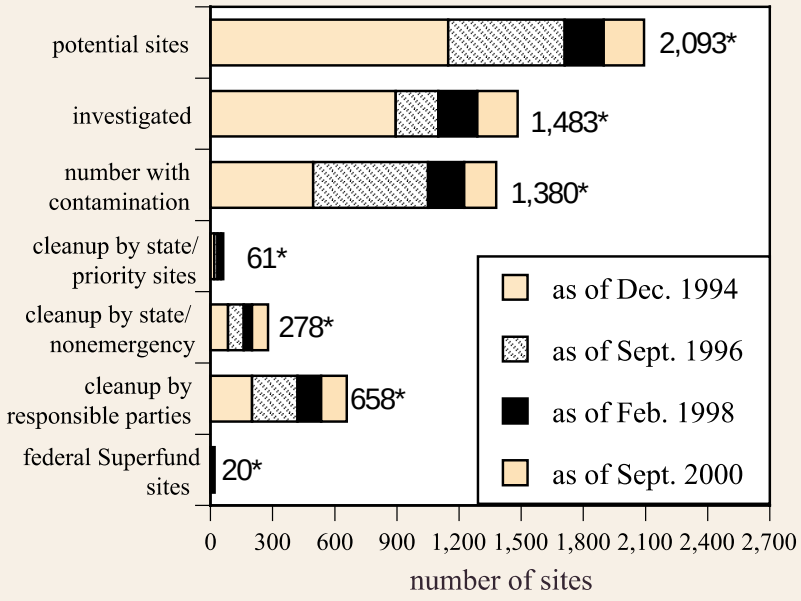
Goal Eliminate the health and environmental threats posed by contaminated waste sites.

Progress To date, more than 2,000 potentially contaminated waste sites have been identified in Kentucky. Of the 1,483 hazardous waste sites investigated, 1,389 had confirmed contamination, and 77 percent have been remediated by the state or responsible parties.

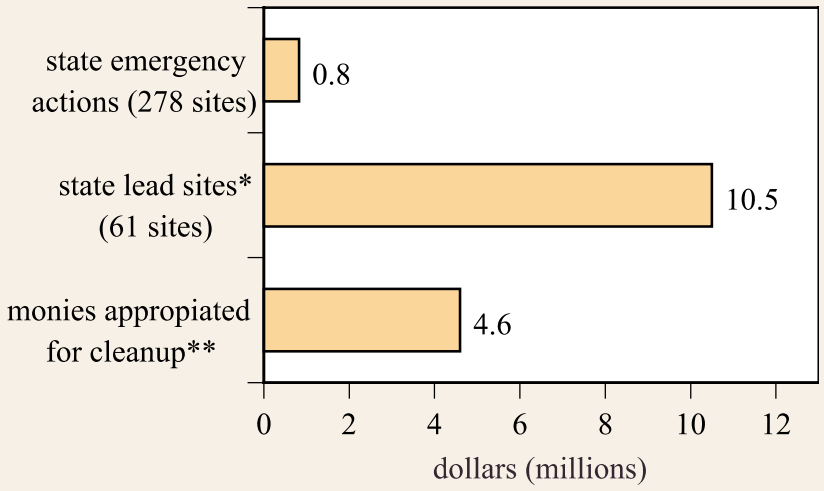
A primary source of funds to clean up contaminated waste sites where responsible parties cannot be found or are financially unable to cleanup a site is the Kentucky Hazardous Waste Management Fund. The fund, established in 1981 and later amended in 1990, is financed through a fee on hazardous waste generated. Each year, about $2.1 million is collected from hazardous waste generators to finance site cleanups. To date, the fund has financed the investigation and remediation of 61 contaminated priority waste sites. In addition, 278 emergency and non-emergency removal operations have been conducted. More than $10 million has been spent from the fund to remediate contaminated sites. The Hazardous Waste Management Fund was scheduled to expire June 30, 2000 but was extended another two years during the 2000 legislative session. At this time, the state has 15 active state priority waste sites that are under remediation using fund monies.

Kentucky has also seen some progress in the remediation of its federal Superfund sites. Seventeen of the 20 federal Superfund sites in Kentucky have had remediation completed or

Measure 1. Contaminated Waste Sites in Kentucky



Measure 2. Expenditures from the Kentucky Hazardous Waste Management Fund



Measure 3. State Priority Waste Sites (1999-2000)

Site	County	Date discovered	Status
Tindall Property	Anderson	1985	RI
Cornish Property	Anderson	1999	RA
Johnson Fork Dump	Boyd	1987	CP
Douglas Lane	Boyle	1996	RI
Mudd Property	Bullitt	1992	RI
Ecology Systems	Calloway	1984	RI
Tobacco State	Fayette	1988	RI
Great South. Refinery	Fayette	1997	RI
Jeff Meade Landfill	Greenup	1979	RD
Billy Glover Dump	Jessamine	1985	RA
Ponderosa Speedway	Lincoln	1997	RI
Allen Chemical	Marion	1976	RI
Derby Tank & Car	Meade	1979	RI
Briar Hill Dump	Scott	2000	RI
Rad Chemical	Warren	1980	RD

Contaminated Waste Sites

Measure 4. Status of Federal Superfund Sites in Kentucky

Site	Listed	Status
A.L. Taylor-Valley of Drums Brooks–Bullitt Co.	1981	cleanup complete-O&M
B.F. Goodrich/Airco (2 sites) Calvert City–Marshall Co.	1982	cleanup complete-O&M
Distler Brickyard West Point–Hardin Co.	1982	cleanup complete-O&M
Distler Farm Louisville–Jefferson Co.	1982	cleanup complete-O&M
Lee's Lane Landfill Louisville–Jefferson Co.	1982	cleanup complete-O&M
Newport Dump Wilder–Campbell Co.	1982	cleanup complete-O&M
Smith's Farm Brooks–Bullitt Co.	1984	cleanup complete-O&M
Maxey Flats Hillsboro–Fleming Co.	1986	cleanup underway
Howe Valley Howe Valley–Hardin Co.	1987	cleanup complete
Red–Penn Sanitation Co. Peewee Valley–Oldham Co.	1989	cleanup complete-O&M
Tri–City Indstrl. Disp. Site Brooks–Bullitt Co.	1989	cleanup complete-O&M
Brantley Landfill Island–McLean Co.	1990	cleanup complete-O&M
Caldwell Lace & Leather Auburn–Logan Co.	1990	no action required
Fort Hartford Coal Olaton–Ohio Co.	1990	cleanup complete-O&M
General Tire & Rubber Mayfield–Graves Co.	1990	no action required
Green River Disposal Site Maceo–Daviess Co.	1990	cleanup complete-O&M
Paducah Gaseous Diff. Plant Paducah-McCracken Co.	1992	site study
National Southwire Alum. Hawesville-Hancock Co.	1992	cleanup remedy selected
National Elec. Coil Dayhoit-Harlan Co.	1992	cleanup

required no further action.

The most costly cleanup of a contaminated waste site in Kentucky is currently underway. The operation of the Paducah Gaseous Diffusion Plant (PGDP) has produced a number of contaminated areas, both at the site and beyond its boundaries. The U.S. Department of Energy (DOE) began operations at the plant in 1952 to make enriched uranium for use in nuclear weapons and later for commercial nuclear fuel. While making an estimated 200,000 tons of nuclear fuel, the plant also generated significant amounts of radioactive waste which has polluted the land and groundwater with radioactive and other contaminants. PGDP is on the U.S. Environmental Protection Agency's National Priorities List. A 2010 deadline has been set by the state for DOE to clean up the Paducah Gaseous Diffusion Plant. Since August 2000, DOE has removed Drum Mountain, an 8,000-ton pile of crushed and contaminated barrels. Work will begin later this year to remove more than 50,000 tons of scrap metal stored at plant. Technology has also been installed to remove trichloroethylene from soil and three new technologies are under consideration to remove contaminants from the groundwater. The Department of Energy has spent $111,226,000 from 1988 to 1999 in its clean up efforts. In fiscal year 2000, DOE spent $16,139,000 on clean up activities. The DOE has estimated it will cost $1.3 billion to eliminate all the contamination. However, the state estimates that cleanup costs will range from $2 billion to $4 billion.

The redevelopment of old contaminated sites was the focus of a bill passed during the 2001 Kentucky legislative session was the "Voluntary Environmental Remediation Act," better known as the brownfields bill. Brownfields are abandoned, idle, or under-used industrial or commercial facilities where redevelopment is complicated by environmental contamination. Many sites that were once used for industrial purposes have been abandoned, and potential developers are reluctant to use these sites because of the liability they pose for any contamination that may be present on the site. Developers are more attracted to sites in pristine, undeveloped areas to avoid liability issues. Development of these undeveloped sites, termed "greenfields," contributes to urban sprawl and unplanned urban expansion. The legislation builds on existing law to define the process to identify and manage or remove contaminants at brownfield sites. Provisions of the bill also address owner liability issues associated with brownfield redevelopment.

Measures - notes and sources

***Measure 1**. *Cumulative total 1994 through 2000. Data revised by the Division of Waste Management from previous EQC reports. Source: Ky. Division of Waste Management*

***Measure 2**. Cumulative total as of September 2000.*

**Total funds used for remediation. ***Funds appropriated for remediation (cleanup underway) Source: Ky. Division of Waste Management.*

***Measure 3**. RD - Remedial design (cleanup plan under development). RA - Remedial assessment (site under study). RI-Remedial investigation (site under investigation). CP - cleanup in progress. Source: Ky. Division of Waste Management*

***Measure 4**. O&M - Remediation complete and in operation and maintenance phase. Source: Ky. Division of Waste Management.*

Underground Storage Tanks

Indicator 12. Underground Storage Tanks

At a Glance

Number of underground storage tanks
active tanks. . . 13,000
closed tanks . . 31,700

Underground storage tanks with:
contamination . .11,452
remediated 8,666
long-term cleanup. 392

UST inspections
1995. 5,614
1999 2,481

UST violations
1995 1,241
1999 112

Background Underground petroleum and hazardous chemical storage tanks began to be regulated in Kentucky in 1986. These tanks can leak and pose pollution threats to drinking water supplies and to the environment

There are 46,407 underground storage tanks (USTs) currently registered in Kentucky. As of February 2001, an estimated 13,068 tanks are in active use, 1,584 are in temporary closure (have not fully met closure and cleanup requirements), and 31,755 have been permanently closed in accordance with state regulations. It is estimated that there are thousands of tanks in Kentucky at abandoned gas stations and other locations that have not been registered.

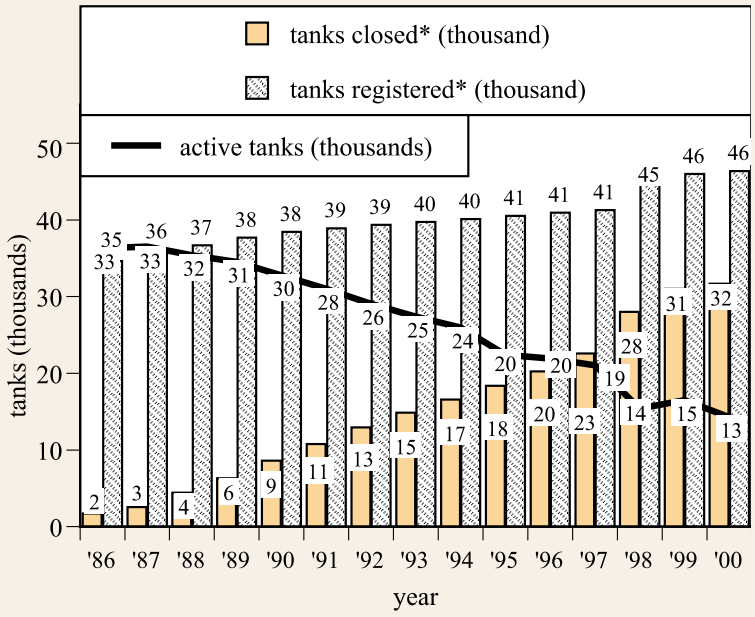
Goal Oversee the permanent closure, investigation and remediation of UST sites and ensure compliance for all active underground storage tanks for leak detection, spill prevention, overfill prevention and corrosion protection requirements.

Progress As of January 2001, 90 percent of the 13,068 active registered USTs met release detection rules and 98 percent met the overfill, corrosion protection and spill prevention requirements as specified in federal and state laws. This is a significant improvement since November 1998, when 45 percent of the active tanks did not meet the tank rules. All tanks in Kentucky that failed to meet the tank upgrade rules as required by Dec. 22, 1998 were assessed penalties, resulting in the highest penalty collection levels (in 1999) since EQC began tracking UST enforcement actions.

As of January 2001, 11,452 UST facilities had performed investigation and corrective action activities. Of these, 8,666 UST sites have been remediated. Most UST sites simply require the removal of soil to address contamination problems. However, some UST sites require additional remediation actions to address groundwater contamination. Currently, 392 UST sites are in long-term corrective action. These sites require actions such as the pump and treatment of groundwater or bioremedation to address contamination problems.

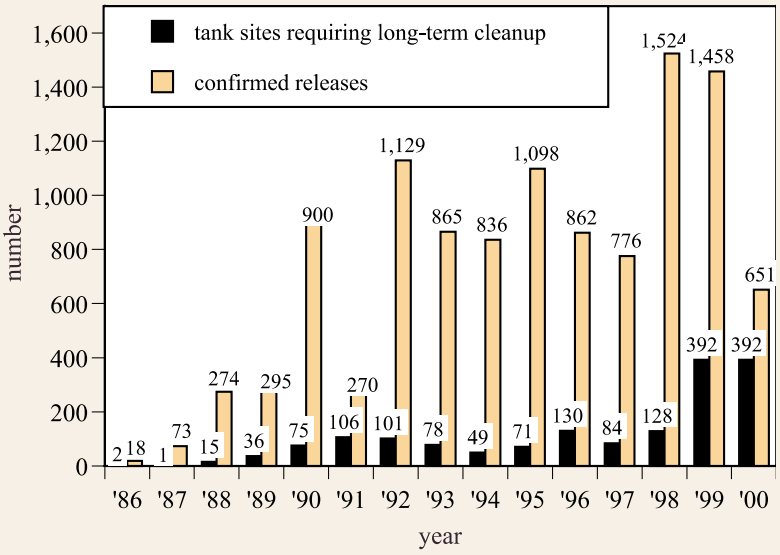
In 1990, Kentucky established the Petroleum Storage Tank Assurance Fund. The fund was created to help UST owners and operators comply with federally mandated financial responsibility requirements and to reimburse owners and operators for eligible costs of corrective actions related to leaking USTs. The fund's revenues are generated primarily through a fee of 1.4 cents per gallon of motor fuel sold in the state. As of December 2000, the fund has obligated $276.4 million for site investigations, tank removals and remedial activities at 4,082 UST facilities. The fund has processed 19,256 payment claims resulting in the reimbursements of $213.7 million to UST owners and operators. Currently, 460 applications for financial assistance amounting to $31.4 million are pending approval. The average cost of a UST cleanup has been $63,108 per site. There are 2,747 UST project fund cleanups currently underway.

Measure 1. Underground Storage Tanks in Kentucky

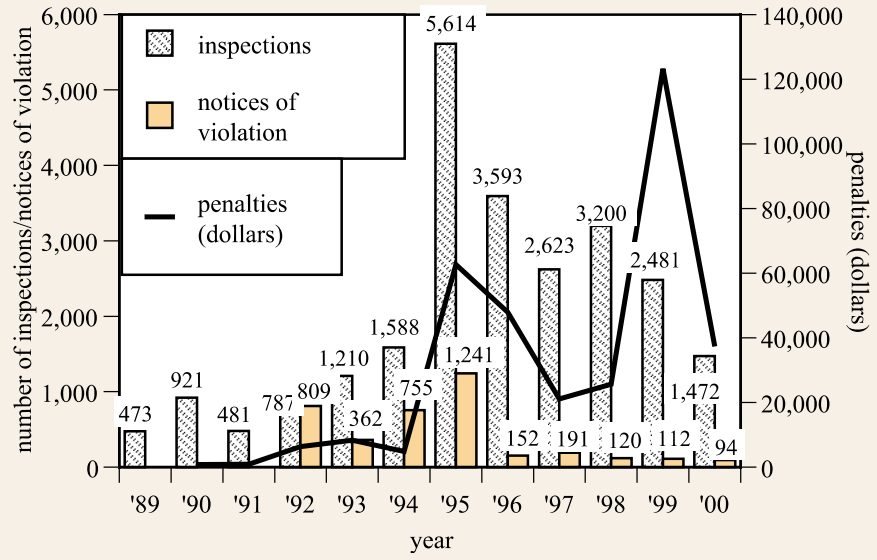


UNDERGROUND STORAGE TANKS

Measure 2. Underground Storage Tank Contamination Incidents in Kentucky



Measure 2. Underground Storage Tank Enforcement Actions in Kentucky



Measures - notes and sources

***Measure 1**. *Cumulative total to date for tanks closed and registered. Source: Ky. Division of Waste Management.*

***Measure 2**. Sites with groundwater and/or soil contamination. Confirmed releases are defined as either laboratory or field evidence of contamination. Source: Ky. Division of Waste Management.*

***Measure 3**. Penalty dollars represent the amount collected per year. Source: Ky. Division of Waste Management.*